

# **EXHIBIT 8**



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## Medical Misuse of Controlled Medications Among Adolescents

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### Abstract

**Objectives**—To determine the past-year medical misuse prevalence for 4 controlled medication classes (pain, stimulant, sleeping, and antianxiety) among adolescents, and to assess substance use outcomes among adolescents who report medical misuse.

**Design**—A Web-based survey was self-administered by 2744 secondary school students in 2009–2010.

**Setting**—Two southeastern Michigan school districts.

**Participants**—The sample had a mean age of 14.8 years and was 51.1% female. The racial/ethnic distribution was 65.0% white, 29.5% African American, 3.7% Asian, 1.3% Hispanic, and 0.5% other.

**Main Outcome Measures**—Past-year medical use and misuse of 4 controlled medication classes.

**Results**—Eighteen percent of the sample reported past-year medical use of at least 1 prescribed controlled medication. Among past-year medical users, 22.0% reported misuse of their controlled medications, including taking too much, intentionally getting high, or using to increase alcohol or other drug effects. Medical misusers were more likely than nonmisusers to divert their controlled medications and to abuse other substances. The odds of a positive screening result for drug abuse were substantially higher among medical misusers (adjusted odds ratio, 7.8; 95% confidence interval, 4.3–14.2) compared with medical users who used their controlled medications appropriately. The odds of drug abuse did not differ between medical users who used their controlled medications appropriately and nonusers.

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**Author Contributions:** Drs McCabe and Cranford and Mr West had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design* McCabe, Young, Teter, and Boyd.

*Acquisition of data* McCabe, Ross-Durow, Young, and Boyd. *Analysis and interpretation of data* McCabe, West, Cranford, and Teter. *Drafting of the manuscript* McCabe, West, Cranford, Ross-Durow, Teter, and Boyd. *Critical revision of the manuscript for important intellectual content* McCabe, West, Young, Teter, and Boyd. *Statistical analysis* McCabe, West, and Cranford. *Obtained funding* McCabe, Young, Teter, and Boyd. *Administrative, technical, and material support* McCabe and Ross-Durow. *Study supervision* McCabe and Boyd.

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**Conclusions**—Most adolescents who used controlled medications took their medications appropriately. Substance use and diversion of controlled medications were more prevalent among adolescents who misused their controlled medications. Careful therapeutic monitoring could reduce medical misuse and diversion of controlled medications among adolescents.

Over the past 15 years, the prescribing of controlled medications (eg, pain, stimulant, sleeping, and antianxiety) has been increasing among children and adolescents in the United States; these medications are considered medically sound and efficacious in treating a wide range of childhood and adolescent disorders.<sup>1-10</sup> Despite the importance of controlled medications in treating childhood and adolescent disorders, a consequence of this increase in prescribing may be a concomitant rise in medical misuse, diversion of controlled medications, and nonmedical use of controlled medications among adolescents. For this investigation, medical misuse was defined as the use of a controlled psychotherapeutic medication by a patient in a manner not intended by the prescribing health care professional, including (but not limited to) not following the prescribed dosage, using intentionally to get high, not taking the medication within a prescribed interval, or co-ingesting with alcohol or other drugs.

To date, no studies have examined medical misuse of 4 controlled medication classes (ie, pain, stimulant, sleeping, and antianxiety) among adolescents. Therefore, it remains unclear whether adolescents are taking their controlled medications as prescribed. Most adult users of controlled medications seem to use them appropriately<sup>11,12</sup>; however, case reports,<sup>13-16</sup> poison center reports,<sup>17,18</sup> clinical studies,<sup>12</sup> and epidemiological studies<sup>19-21</sup> indicate that some individuals have used their controlled medications in a manner other than that intended by the prescribing clinician.

Together, these investigations of adults demonstrate that medical misuse occurs and serve as strong evidence that more research is needed to assess the magnitude and characteristics of this problem among younger adolescents. The main objectives of this study were (1) to determine the past-year medical misuse prevalence for 4 controlled medication classes (pain, stimulant, sleeping, and antianxiety) among adolescents ages 11 to 19 years in southeastern Michigan and (2) to assess substance use and abuse outcomes among adolescents who report medical misuse of controlled medications.

## Methods

This study was conducted during a 5-month period between December 10, 2009, and April 30, 2010, drawing on the entire population of middle and high school students (grades 7-12) attending 2 public school districts in the Detroit, Michigan, metropolitan area. The study was approved by the University of Michigan Institutional Review Board, and a Certificate of Confidentiality was obtained from the National Institutes of Health. All the parents in the school districts were sent letters requesting permission for their children to participate in the Secondary Student Life Survey, explaining that participation was voluntary, describing the relevance of the study, and assuring that all responses would be kept confidential. The Web-based survey used in this study was maintained on a hosted secure Internet site running under a secure sockets layer protocol to ensure safe transmission of data. The final response rate was 61.7%, which falls within the range of response rates from schools in a 2009 national school-based study<sup>22</sup> of secondary school students using comparable data collection procedures.

The final sample consisted of 2597 middle and high school students (51.1% female and 48.9% male). In total, 2744 secondary school students responded to the Web-based survey; 2597 of them completed the questions that form the basis of this study. The mean (SD) age

of respondents in the sample was 14.8 (1.9) years. The racial/ethnic distribution was 65.0% white, 29.5% African American, 3.7% Asian, 1.3% Hispanic, and 0.5% other.

The Secondary Student Life Survey includes items from several national studies<sup>23-25</sup> of alcohol and other drug use. Standard measures of substance use were included, such as cigarette smoking in the past month, binge drinking in the past 2 weeks, nonmedical use of prescription medications, and marijuana and other illicit drug use in the past year.<sup>23-25</sup>

Medical use of controlled medications was measured using the following question: “The following questions are about the use of prescribed medicines. We are not interested in your use of over-the-counter medicines that can be bought in drug or grocery stores without a prescription, such as aspirin, Sominex (GlaxoSmithKline, London, United Kingdom), Benadryl (McNeil Consumer Healthcare, a subsidiary of Johnson & Johnson, New Brunswick, New Jersey), Tylenol PM (McNeil Consumer Healthcare, a subsidiary of Johnson & Johnson), cough medicine, etc. On how many occasions in your lifetime has a doctor, dentist, or nurse prescribed the following types of medicine for you?” A separate question was asked for each of the following 4 controlled medication classes and examples of generic and brand names were provided to respondents: (1) prescribed sleeping medication (eg, zolpidem [Ambien; sanofi-aventis, Bridgewater, New Jersey], eszopiclone [Lunesta; Sepracor, Marlborough, Massachusetts], temazepam [Restoril; Mallinckrodt Pharmaceuticals, Hazelwood, Missouri], generic tempazepam, and generic triazolam), (2) prescribed antianxiety medication (eg, lorazepam [Ativan; Biovail Pharmaceutical, Inc, Mississauga, Ontario, Canada], alprazolam [Xanax; Pfizer, Inc, New York, New York], diazepam [Valium; Roche Laboratories, Inc, Nutley, New Jersey], clonazepam [Klonopin; Hoffmann-La Roche, Inc, Nutley, New Jersey], generic diazepam, and generic lorazepam), (3) prescribed stimulant medication (eg, methylphenidate hydrochloride [Ritalin; Novartis Pharmaceuticals Corporation, East Hanover, New Jersey], dextroamphetamine sulfate [Dexedrine; Catalent Pharma Solutions, Winchester, Kentucky], dextroamphetamine-amphetamine [Adderall; Shire US, Inc, Wayne, Pennsylvania], and methylphenidate hydrochloride [Concerta; ALZA Corporation, Mountain View, California], and generic methylphenidate), and (4) prescribed pain medication (eg, opioids, such as acetaminophen-hydrocodone bitartrate [Vicodin; Abbott Laboratories, Abbott Park, Illinois], oxycodone [OxyContin; Purdue Pharma LP, Stamford, Connecticut], acetaminophen-codeine phosphate [Tylenol 3 with codeine; Johnson & Johnson], acetaminophen-oxycodone hydrochloride [Percocet; DuPont Merck Pharmaceutical Company, Wilmington, Delaware], acetaminophen-propoxyphene napsylate [Darvocet-N; Eli Lilly and Company, Indianapolis, Indiana], generic morphine sulfate, generic hydrocodone, and generic oxycodone and morphine sulfate). Similar questions were asked about past-year use. The response scale for each question ranged from (1) 0 occasions to (7) 40 or more occasions. For analysis, a binary variable indicating medical use (yes or no) was created for each class of prescription medication, and a binary variable indicating any medical use (yes or no) was created by summing the medical use of the 4 controlled medication classes.

Medical misuse was assessed by asking about the following behaviors as they relate to prescribed use of the 4 controlled medication classes: “On how many occasions (if any) in the past 12 months have you ... 1) ... used too much (e.g., higher doses, more frequent doses) of your prescribed medication? 2) ... intentionally gotten high with your prescribed medication or used it to increase other drug or alcohol effects?” The response scale for each question and coding were identical to those for medical use.

Diversion of controlled medications was assessed by asking the following questions as they relate to prescribed use of the 4 controlled medication classes: “On how many occasions (if any) in your lifetime have you ever ... 1) ... sold any of your prescription medication to

someone? 2) ... given or loaned your prescription medication to someone? 3) ... traded your prescription medication for something else (e.g., other medications, other drugs, clothes, etc.)?" The response scale for each question and coding were identical to those for medical use.

The Drug Abuse Screening Test, Short Form (DAST-10) was used to screen for probable drug abuse or dependence on a wide variety of substances other than alcohol.<sup>26</sup> Respondents who used drugs other than alcohol in the past 12 months were asked whether they had experienced any of 10 drug-related problems in the past 12 months. Based on previous research, if a respondent positively endorsed 3 or more DAST-10 items, this was considered a positive screening result, denoting risk for probable drug abuse or dependence.<sup>26-28</sup> The DAST-10 has been shown to have good reliability, temporal stability, concurrent validity, and predictive validity.<sup>27,29,30</sup>

The CRAFFT (car, relax, alone, forget, friends, trouble) mnemonic is a 6-item self-report brief alcohol or other drug screening test developed specifically for adolescents.<sup>31</sup> It has acceptable reliability ( $\alpha = .79$ ) and is highly correlated ( $r = 0.84$ ) with the Personal Involvement With Chemicals Scale, the criterion standard for alcohol or other drug screening.<sup>31</sup> Based on previous research, if a respondent positively endorsed 2 or more CRAFFT items, this was considered a positive screening result.<sup>31</sup>

Data analyses included 2597 respondents who completed the questions that form the basis of this study. All the statistical analyses were performed using commercially available software (SPSS 18.0; SPSS, Inc, Chicago, Illinois).  $\chi^2$  Tests were used to compare the prevalence of past-year medical use and misuse of controlled medications among different subclasses of students.  $\chi^2$  Tests and multiple logistic regression models were used to compare the odds of drug use behaviors across the following 3 mutually exclusive groups of past-year controlled medication users: (1) no use, (2) medical use, and (3) medical misuse. Multiple logistic regression models used nonusers as the reference group and included sex, race/ethnicity, school district, and grade level as covariates. Adjusted odds ratios (AORs) and 95% confidence intervals (95% CIs) were computed to describe adjusted contrasts among the 3 groups.

## Results

The past-year medical use prevalence for at least 1 of 4 prescribed controlled medication classes (pain, stimulant, sleeping, and antianxiety) was 18.0% and was higher among female vs male adolescents (20.8% vs 15.1%;  $\chi^2_1=14.0$ ,  $P<.001$ ). The past-year medical use prevalence differed by medication class as follows: 1.6% for sleeping medication, 2.2% for antianxiety medication, 3.5% for stimulant medication, and 14.2% for pain medication. Among past-year medical users, 22.0% reported misuse of their controlled medications. For each of 4 controlled medication classes, the past-year prevalence of taking too much was greater than that of intentionally getting high or using medication to increase alcohol or other drug effects. As summarized in Table 1, the past-year prevalence of medical misuse varied by medication class and ranged from 20.1% for pain medication to 43.9% for sleeping medication.

Frequent users of controlled medications ( $\geq 10$  occasions in their lifetimes) tended to have a higher prevalence of medical misuse than those who used less frequently. For example, 36.4% of those who used pain medication frequently reported taking too much compared with 19.8% of those who used pain medication on 3 to 9 occasions and 14.4% of those who used it on 1 or 2 occasions ( $\chi^2_2=9.6$ ,  $P<.01$ ). The same associations were observed for frequent users of sleeping and antianxiety medications but not stimulants. The prevalence of

medical misuse tended to be lower among users of 1 controlled medication class than among those who used multiple medication classes. Overall, the prevalence of medical misuse was as follows: 14.0% among 57 users of stimulant medication only, 18.0% among 316 users of pain medication only, and 43.5% among 62 users of multiple medications.

The associations among nonusers, medical users, medical misusers, and substance use behaviors were examined using  $\chi^2$  analysis and revealed statistically significant relationships for all comparisons ( $P < .001$ ). As summarized in Table 2, medical misusers had a higher prevalence of all substance use and abuse behaviors than medical users who took their medications appropriately.

Multiple logistic regression results indicated that the odds of all substance use and abuse behaviors were significantly greater for past-year medical misusers than for past-year medical users who took their medications appropriately. For example, the odds of a positive screening result for drug abuse among medical misusers were almost 8 times higher (AOR, 7.8; 95% CI, 4.3-14.2;  $P < .001$ ) than among medical users who used their medications appropriately, after controlling for sex, race/ethnicity, school district, and grade level (Table 3). In contrast, the odds of a positive screening result for drug abuse did not differ significantly between medical users and nonusers. After adjusting for covariates, the odds of nonmedical use of controlled medications among nonusers were significantly lower than among medical users.

The bivariate and multivariate analyses summarized in Tables 2 and 3 were repeated for each medication class, and the same patterns were found. In general, substance use and abuse outcomes did not differ significantly between past-year medical users and past-year nonusers regardless of medication class; however, medical misusers had significantly higher odds of substance use and abuse than medical users for each medication class. The results for pain medication are given in Table 4.

Because the CRAFFT and DAST-10 items were asked only of respondents who used alcohol or other drugs in the past 12 months, analyses based on these instruments (Tables 2, 3, and 4) were repeated across the 3 mutually exclusive categories of controlled medication users among individuals who used alcohol or other drugs in the past 12 months. The findings in these analyses were consistent with the results based on the entire sample.

The associations between past-year medical misuse and diversion of controlled medications were also examined using  $\chi^2$  analysis and revealed statistically significant relationships. As summarized in Table 5, medical misusers had a significantly higher prevalence of diversion of controlled medications than medical users who took their medications appropriately. Results of multiple logistic regression models indicated that the odds of lifetime diversion of controlled medications for past-year medical misusers were significantly greater than those for medical users who took their medications appropriately. After adjusting for sociodemographic covariates, the odds of any form of diversion of controlled medications (eg, sell, give away, loan, or trade) among past-year medical misusers were more than 4 times higher (AOR, 4.3; 95% CI, 2.5-7.4;  $P < .001$ ) than among medical users who took their medications appropriately.

## Comment

The main objective of this study was to determine the past-year medical misuse prevalence for prescribed controlled medications among adolescents at 2 southeastern Michigan school districts in the United States. The results indicated that medical misuse of at least 1 among 4 controlled medication classes (ie, pain, stimulant, sleeping, and antianxiety) occurred in more than 1 of every 5 adolescents (22.0%) who were prescribed controlled medications in



the past 12 months. This prevalence concurs with previous research that has assessed medical misuse of prescribed stimulant medication among young adults and college students.<sup>12,19-21</sup> The present study found that frequent users of pain, sleeping, and antianxiety medications tended to have a higher prevalence of medical misuse than less frequent users; however, the same was not true for users of stimulant medications.

The present study revealed that substance use and abuse were more prevalent among adolescents who misused their controlled medications. Medical misusers were significantly more likely to screen positive for substance abuse and to engage in binge drinking, cigarette smoking, and marijuana use compared with medical users who took their medications appropriately. After adjusting for covariates, medical users had greater odds of nonmedical use of controlled medications than past-year nonusers. Despite the importance of controlled medications for the treatment of pediatric disorders, our results suggest that a consequence of the greater availability of these medications may be an increase in their non-medical use. These findings suggest that health professionals should conduct routine screening for substance use disorders, especially among adolescents who have a history of medically misusing their pain, stimulant, sleeping, or antianxiety medications. Individuals who screen positive for a substance use disorder should be referred for a more in-depth substance use disorder assessment, and medications that are less prone to abuse should be considered for those with a substance use disorder who are in need of controlled medications. Although it remains unclear whether the misuse of controlled medications precedes other substance use behaviors, there is a pattern of higher rates of substance abuse among medical misusers that deserves more attention.

Our results indicated that medical misusers were more likely to divert their controlled medications than medical users who took their medications appropriately. Diversion of controlled medications facilitates access to these medications for those without a prescription (ie, non-medical use), especially because peers serve as the primary source of diversion among adolescents who report nonmedical use and because adolescents are most likely to divert their controlled medications to peers.<sup>32-35</sup>

The most prevalent form of medical misuse for each of the 4 controlled medication classes was taking too much (eg, higher doses or more frequent doses). Clinicians must balance the risks and benefits of controlled medication use with the abuse potential when assessing, treating, and monitoring their patients. There are steps that can be taken by clinicians to help minimize the misuse of these beneficial medications. First, they should instruct patients to consult with their prescribing clinician before adjusting their doses. Second, clinicians should be familiar with effective medication alternatives that carry less risk for abuse. Medications that carry less risk for abuse based on their pharmacological profile are available for many conditions. Third, the use of pharmaceutical delivery systems that are not easily manipulated (eg, for injection or snorting) as alternate routes of administration might help limit the misuse of some controlled medications. As technology improves, more delivery systems will become available that make it difficult to alter each medication's pharmacokinetic profile (eg, absorption rate), which is key to reducing its abuse potential. Fourth, the use of additional aids to help safely and effectively prescribe and monitor medications, such as prescription drug monitoring programs and behavioral monitoring techniques, is appropriate.

Centralized prescription databases, such as prescription drug monitoring programs that are available in more than 30 states, allow clinicians to access patients' prescription records. Although these programs vary by state, they may (if used properly) help curb the misuse of controlled medications. For example, they could enhance monitoring and detection of drug-seeking behaviors, such as physician shopping or the use of multiple pharmacies to obtain

controlled medications. Behavioral monitoring can be accomplished by the use of patient risk factor checklists (eg, psychiatric or personality disorder, tobacco use, or family history of substance use) or scales specifically developed to detect the increased likelihood of aberrant drug-taking behaviors (eg, the Screening Instrument for Substance Abuse Potential). A combination of these approaches is likely to provide the greatest probability of reducing medication misuse.

There were some limitations that should be considered when evaluating the results of the present study. First, the findings cannot be generalized to other adolescent populations because the sample was regional and did not include individuals who had dropped out of school. Second, differential nonresponse across racial/ethnic groups and self-report of substance use behaviors may have introduced bias in the estimates reported in the present study. Our study minimized potential biases by using computer-based self-administration, informing potential respondents that participation was voluntary, and assuring potential respondents that data would remain confidential.<sup>36-39</sup> In addition, medical misuse, substance use and abuse, and other adverse outcomes were not found to differ significantly as a function of race/ethnicity, suggesting that any nonresponse bias would be minimal. Comparisons between the respondents and nonrespondents in the present study indicated no statistically significant differences in terms of sex or age.

Third, the DAST-10 item “inability to stop using drugs” was negatively correlated with the 9 other DAST-10 items, and the  $\alpha$  coefficient for the DAST-10 increased from .68 to .78 when this item was removed from the reliability analysis. Previous studies<sup>27,40,41</sup> have noted similar problems with this DAST-10 item. As a result, analyses in the present study were performed using both versions of the DAST-10 (including and excluding the item “inability to stop using drugs”), as well as the CRAFFT instrument, and no significant differences were found between the results with and without the DAST-10 item. Fourth, our measure of medical misuse was adapted from previous research and has not undergone formal psychometric evaluation.<sup>12</sup> Future research should examine sources of controlled medications that were misused, include other medications misused by adolescents, and assess other types of medical misuse (eg, not using the prescribed dose or not taking the medication within a prescribed interval) not covered in this study.

In conclusion, our study found strong associations between the misuse of prescribed controlled medications and substance abuse and diversion of controlled medications in 2 southeastern Michigan school districts (grades 7-12). The findings indicate the need for clinicians to closely monitor prescribed controlled medications among adolescents, as well as the importance of detecting unusual patterns of use, especially for sleeping medications. Clinicians and parents should educate adolescents to use prescribed medications correctly because their misuse could result in nonadherence or lack of therapeutic effect. Moreover, clinicians should consider prescribing controlled medications with less potential for substance abuse and diversion. Careful therapeutic monitoring, centralized prescription databases, and increased patient education could facilitate reductions in medical misuse, nonmedical use, and diversion of controlled medications among adolescents.

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**Table 1**  
**Medical Misuse of Controlled Medications**

Controlled Medication Prescribed in Past Year	Past Year, No. (%)		
	Any Medical Misuse	Took Too Much	Intentionally Got High or Used to Increase Alcohol or Other Drug Effects
Any (n=468)	103 (22.0)	96 (20.5)	45 (9.6)
Pain (n=369)	74 (20.1)	67 (18.2)	34 (9.2)
Stimulant (n=91)	20 (22.0)	20 (22.0)	10 (11.0)
Sleeping (n=41)	18 (43.9)	17 (41.5)	7 (17.1)
Antianxiety (n=57)	17 (29.8)	16 (28.1)	9 (15.8)

**Table 2**  
**Substance Use and Abuse Behaviors and Medical Use and Medical Misuse of Controlled Medications**

Substance Use and Abuse Behavior	Past Year, No. (%) <sup>a</sup>			$\chi^2$ Value <sup>b</sup>
	Medical Use	Medical Misuse	No Use	
Past-month cigarette smoking	28 (7.8)	26 (26.3)	103 (4.9)	76.5
Past-year binge drinking <sup>c</sup>	33 (9.8)	28 (29.5)	109 (5.5)	84.7
Past-month alcohol use	58 (16.4)	34 (33.7)	212 (10.3)	56.9
Past 2-wk binge drinking <sup>c</sup>	21 (5.9)	18 (18.0)	64 (3.1)	57.3
Past-year CRAFFT <sup>31</sup> positive screening result	55 (15.5)	36 (36.0)	210 (10.1)	66.1
Past-year use of marijuana	52 (14.5)	37 (37.0)	198 (9.5)	76.5
Past-year use of other illicit drug <sup>d</sup>	13 (3.6)	16 (15.7)	30 (1.4)	91.2
Past-year nonmedical use of prescription medication <sup>e</sup>	47 (13.8)	25 (26.3)	111 (5.4)	81.2
Past-year Drug Abuse Screening Test, Short Form <sup>26</sup> positive screening result	33 (9.1)	36 (35.0)	97 (4.6)	156.6

Abbreviation: CRAFFT, car, relax, alone, forget, friends, trouble.

<sup>a</sup> Because of missing data, the sample sizes ranged from 336 to 362 for medical use, 95 to 103 for medical misuse, and 1990 to 2103 for no use.

<sup>b</sup>  $P < .001$  for all comparisons.

<sup>c</sup> Consumption of 5 or more drinks for men and 4 or more drinks for women in a 2-hour period.

<sup>d</sup> Any use of at least 1 of the following drugs: cocaine, lysergic acid diethylamide, other psychedelics, crystal methamphetamine, heroin, inhalants, 3,4-methylenedioxymethamphetamine (ecstasy),  $\gamma$ -hydroxybutyric acid (GHB), or flunitrazepam (Rohypnol; Roche Laboratories, Inc, Nutley, New Jersey).

<sup>e</sup> Misuse of at least 1 of the following controlled medication classes not prescribed to you: pain, stimulant, sleeping, and anti-anxiety.

**Table 3**  
**Odds of Substance Use and Abuse Behaviors as a Function of Medical Use and Medical Misuse of Controlled Medications**

Substance Use and Abuse Behavior	Past Year, Adjusted Odds Ratio (95% Confidence Interval) <sup>a</sup>		
	Medical Use	Medical Misuse <sup>b</sup>	No Use
Past-month cigarette smoking	[Reference]	5.1 (2.7-9.6)	0.9 (0.6-1.4)
Past-year binge drinking	[Reference]	6.1 (3.1-11.9)	0.8 (0.5-1.2)
Past-month alcohol use	[Reference]	3.0 (1.7-5.1)	0.8 (0.5-1.1)
Past 2-wk binge drinking	[Reference]	4.4 (2.1-9.1)	0.8 (0.5-1.3)
Past-year CRAFFT <sup>31</sup> positive screening result	[Reference]	3.7 (2.1-6.5)	0.8 (0.6-1.2)
Past-year use of marijuana	[Reference]	4.2 (2.4-7.3)	0.8 (0.6-1.2)
Past-year use of other illicit drug	[Reference]	7.4 (3.3-17.0)	0.5 (0.2-0.9) <sup>c</sup>
Past-year nonmedical use of prescription medication	[Reference]	2.2 (1.2-3.9) <sup>d</sup>	0.4 (0.3-0.6) <sup>b</sup>
Past-year Drug Abuse Screening Test, Short Form <sup>26</sup> positive screening result	[Reference]	7.8 (4.3-14.2)	0.7 (0.4-1.0)

Abbreviation: CRAFFT, car, relax, alone, forget, friends, trouble.

<sup>a</sup> Adjusted for sex, race/ethnicity, school district, and grade level. The sample size ranged from 2421 for past-year binge drinking to 2595 for past-year Drug Abuse Screening Test, Short Form positive screening result.

<sup>b</sup>  $P < .001$  unless otherwise indicated.

<sup>c</sup>  $P < .05$ .

<sup>d</sup>  $P < .01$ .



**Table 4**  
**Odds of Substance Use and Abuse Behaviors as a Function of Medical Use and Medical Misuse of Controlled Pain Medications**

Substance Use and Abuse Behavior	Past Year, Adjusted Odds Ratio (95% Confidence Interval) <sup>a</sup>		
	Medical Use	Medical Misuse <sup>b</sup>	No Use
Past-month cigarette smoking	[Reference]	5.9 (2.7-12.9)	1.3 (0.7-2.2)
Past-year binge drinking	[Reference]	7.0 (3.2-15.5)	0.9 (0.5-1.5)
Past-month alcohol use	[Reference]	2.9 (1.5-5.3) <sup>c</sup>	0.7 (0.5-1.0)
Past 2-wk binge drinking	[Reference]	5.0 (2.2-11.4)	0.8 (0.4-1.4)
Past-year CRAFFT <sup>31</sup> positive screening result	[Reference]	3.0 (1.6-5.8) <sup>c</sup>	0.9 (0.6-1.3)
Past-year use of marijuana	[Reference]	4.0 (2.1-7.8)	1.0 (0.6-1.4)
Past-year use of other illicit drug	[Reference]	8.9 (3.3-24.2)	0.7 (0.3-1.6)
Past-year nonmedical use of prescription medication	[Reference]	2.2 (1.1-4.2) <sup>d</sup>	0.5 (0.3-0.7) <sup>b</sup>
Past-year Drug Abuse Screening Test, Short Form <sup>26</sup> positive screening result	[Reference]	9.4 (4.6-19.1)	0.9 (0.5-1.5)

Abbreviation: CRAFFT, car, relax, alone, forget, friends, trouble.

<sup>a</sup> Adjusted for sex, race/ethnicity, school district, and grade level. The sample size ranged from 2421 for past-year binge drinking to 2595 for past-year Drug Abuse Screening Test, Short Form positive screening result.

<sup>b</sup>  $P < .001$  unless otherwise indicated.

<sup>c</sup>  $P < .01$ .

<sup>d</sup>  $P < .05$ .

**Table 5**  
**Diversion of Controlled Medications and Medical Use and Medical Misuse**

Diversion Outcome	Past Year, No. (%)		$\chi^2$ Value <sup>a</sup>
	Medical Use (n=365)	Medical Misuse (n = 103)	
Lifetime approached to divert medication	44 (12.1)	42 (40.8)	44.2
Past year approached to divert medication	32 (8.8)	36 (35.0)	44.4
Lifetime sold your medication	13 (3.6)	18 (17.5)	25.1
Lifetime given or loaned your medication	36 (9.9)	34 (33.0)	33.8
Lifetime traded your medication	5 (1.4)	12 (11.7)	24.3
Lifetime any diversion	47 (12.9)	38 (36.9)	31.2

<sup>a</sup>  $P < .001$  for all